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Corrigendum

Corrigendum to "Optimal-observable analysis of the angular and energy distributions for top-quark decay products at polarized linear colliders" [Nucl. Phys. B 585 (2000) 3–27]

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Eq. (A.3) in Ref. [1] contains an error: $C(D_{VA}{:}A_v)$ in the third line should be replaced with $C(D_{VA}{:}B_v)$ as

$$\begin{aligned}
&\mathcal{F}^{f(*)}_{Bv}(x,\theta)\\
&=\frac{1}{2}\beta^2 C(D_A{:}B_v)f^f(x)(3-\cos^2\theta)+2\alpha_0^f C(D_{VA}{:}B_v)g^f(x)(1+\cos^2\theta)\\
&-\frac{1}{2}\Big[\{C(D_A{:}B_v)+2\alpha_0^f(1-\beta^2)C(D_{VA}{:}B_v)\}f^f(x)\\
&\quad-\{C(D_A{:}B_v)+2\alpha_0^f C(D_{VA}{:}B_v)\}\{2h_1^f(x)-h_2^f(x)\}\Big](1-3\cos^2\theta)\\
&+2\Big[\{\alpha_0^f(1-\beta^2)C(E_A{:}B_v)+2C(E_{VA}{:}B_v)\}f^f(x)+\alpha_0^f C(E_A{:}B_v)g^f(x)\\
&\quad-\{\alpha_0^f C(E_A{:}B_v)+2C(E_{VA}{:}B_v)\}h_1^f(x)\Big]\cos\theta\,.
\end{aligned}\tag{A.3}$$

Due to this correction, the two graphs expressing $\mathcal{F}^{\ell(*)}_{B\gamma}$ and $\mathcal{F}^{\ell(*)}_{BZ}$ in Figs. 1 and 2 are to be replaced with those presented here (see Figs. 1 and 2).

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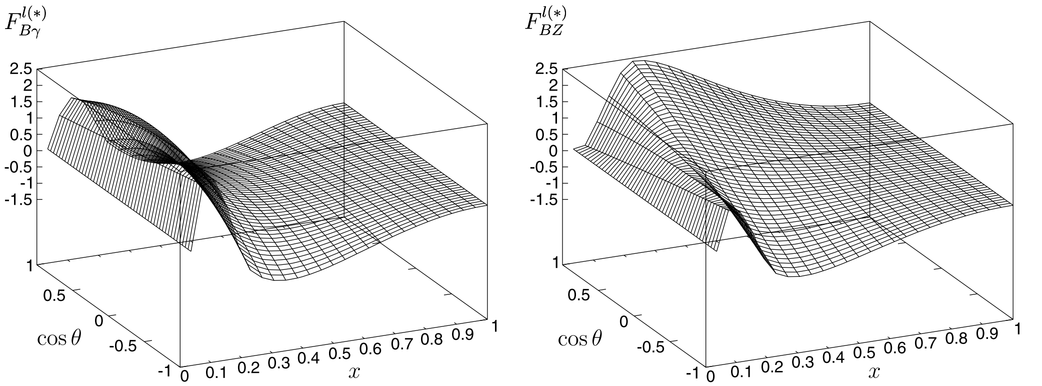

Fig. 1. The shape of $\mathcal{F}^{\ell(*)}_{B\{\gamma,Z\}}$ for unpolarized beams.

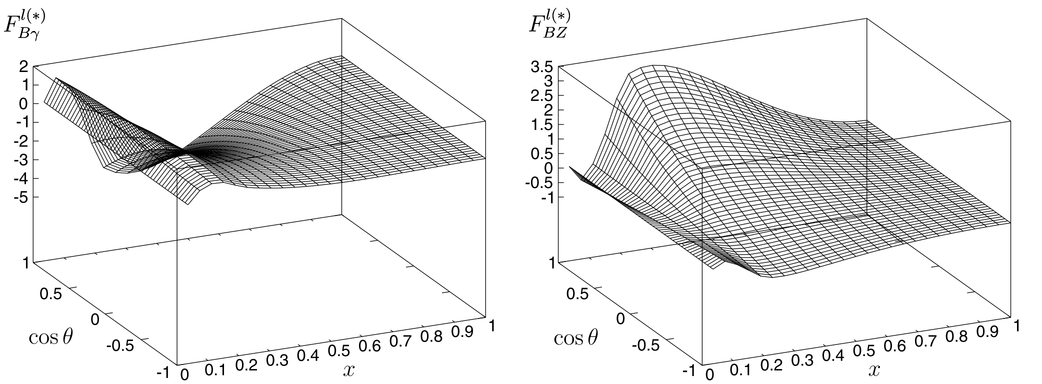

Fig. 2. The shape of $\mathcal{F}^{\ell(*)}_{B\{\gamma,Z\}}$ for $P_{e^-} = P_{e^+} = 0.5$.

The numerical results shown in Eqs. (4.13) and (4.14) are also no longer valid, and we have carried out re-computations. Concerning the former, i.e., Eq. (4.13), after correcting the error we find very large statistical uncertainties for measurements of the nine independent non-SM parameters, therefore, in practice it will be impossible (with no other experimental input) to determine all of them at once through the distribution that was considered, i.e., the one in Eq. (4.5).

Among those non-SM couplings, however, δA_γ term is directly related to the top-quark electric charge and expected to be studied in various other ways. We therefore would like to give the results of an analysis without δA_γ term and replace Eq. (4.13) with

$$\Delta[\mathrm{Re}(\delta A_Z)] = 4.0 \times 10^{-2} \quad \text{for } P_{e^-}/P_{e^+} = 0.4/0.4,$$
$$\left(\begin{array}{llll} ****** & \delta B_\gamma\colon 0.08, & \delta B_Z\colon 0.06, & \delta C_\gamma\colon 0.52 \\ \delta C_Z\colon 1.47, & \delta D_\gamma\colon 5.25, & \delta D_Z\colon 17.8, & f_2^R\colon 0.02 \end{array}\right),$$
$$\Delta[\mathrm{Re}(\delta B_\gamma)] = 7.2 \times 10^{-2} \quad \text{for } P_{e^-}/P_{e^+} = 0.2/0.3,\ 0.3/0.2,$$
$$\left(\begin{array}{llll} \delta A_Z\colon 0.04, & ****** & \delta B_Z\colon 0.05, & \delta C_\gamma\colon 0.25 \\ \delta C_Z\colon 1.17, & \delta D_\gamma\colon 1.86, & \delta D_Z\colon 14.6, & f_2^R\colon 0.03 \end{array}\right),$$
$$\Delta[\mathrm{Re}(\delta B_Z)] = 4.5 \times 10^{-2} \quad \text{for } P_{e^-}/P_{e^+} = 0.2/0.3,\ 0.3/0.2,$$

$$
\begin{aligned}
&\begin{pmatrix} \delta A_Z\!: 0.04,\ \delta B_\gamma\!: 0.07,\ ****** \ \ \delta C_\gamma\!: 0.25 \\ \delta C_Z\!: 1.17,\ \delta D_\gamma\!: 1.86,\ \delta D_Z\!: 14.6,\ \ f_2^R\!: 0.03 \end{pmatrix}, \\
&\Delta[\mathrm{Re}(\delta C_\gamma)] = 1.0 \times 10^{-1} \quad \text{for } P_{e^-}/P_{e^+} = 0.1/0.1, \\
&\begin{pmatrix} \delta A_Z\!: 0.06,\ \delta B_\gamma\!: 0.08,\ \delta B_Z\!: 0.07,\ ****** \\ \delta C_Z\!: 1.07,\ \delta D_\gamma\!: 0.81,\ \delta D_Z\!: 13.9,\ \ f_2^R\!: 0.03 \end{pmatrix}, \\
&\Delta[\mathrm{Re}(\delta C_Z)] = 1.1 \times 10^{0} \quad \text{for } P_{e^-}/P_{e^+} = 0.1/0.1, \\
&\begin{pmatrix} \delta A_Z\!: 0.06,\ \delta B_\gamma\!: 0.08,\ \delta B_Z\!: 0.07,\ \delta C_\gamma\!: 0.10 \\ ****** \ \ \delta D_\gamma\!: 0.81,\ \delta D_Z\!: 13.9,\ \ f_2^R\!: 0.03 \end{pmatrix}, \\
&\Delta[\mathrm{Re}(\delta D_\gamma)] = 6.9 \times 10^{-2} \quad \text{for } P_{e^-}/P_{e^+} = 0.1/0.2,\ 0.2/0.1, \\
&\begin{pmatrix} \delta A_Z\!: 0.05,\ \delta B_\gamma\!: 0.07,\ \delta B_Z\!: 0.06,\ \delta C_\gamma\!: 0.13 \\ \delta C_Z\!: 1.08,\ \ ****** \ \ \delta D_Z\!: 13.9,\ \ f_2^R\!: 0.03 \end{pmatrix}, \\
&\Delta[\mathrm{Re}(\delta D_Z)] = 1.4 \times 10^{+1} \quad \text{for } P_{e^-}/P_{e^+} = 0.1/0.2,\ 0.2/0.1, \\
&\begin{pmatrix} \delta A_Z\!: 0.05,\ \delta B_\gamma\!: 0.07,\ \delta B_Z\!: 0.06,\ \delta C_\gamma\!: 0.13 \\ \delta C_Z\!: 1.08,\ \delta D_\gamma\!: 0.07,\ \ ****** \ \ f_2^R\!: 0.03 \end{pmatrix}.
\end{aligned} \tag{4.13}
$$

On the other hand, Eq. (4.14) is simply to be replaced by

$$\Delta[\mathrm{Re}(f_2^R)] = 1.5 \times 10^{-2} \quad \text{for } P_{e^-} = -0.9 \text{ and } P_{e^+} = -0.9\,. \tag{4.14}$$

In spite of these modifications, conclusions concerning Eq. (4.13) in 4.3.3 are not affected substantially and hold except for those on δA_γ, if only we properly adjust the parameter values used there according to the above corrected equations (4.13) and (4.14).

Acknowledgements

We would like to thank very much Patrick Janot for kindly pointing out that one term in Eq. (A.3) seems unnatural and therefore might be a typo. This led us to rechecking that equation and finding the error mentioned in the beginning.

References

[1] B. Grzadkowski, Z. Hioki, Nucl. Phys. B 585 (2000) 3, arXiv:hep-ph/0004223.